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REMARKS

The Examiner asserted that the title is not descriptive and required that a new title be provided. This requirement is acceded to, and it is hoped that the Examiner finds it satisfactory.

The Examiner has reminded applicants of the proper contents of the Abstract, but has neither formally objected to the Abstract nor explained what failing, if any, the Examiner finds in the Abstract. Nevertheless, a new Abstract is substituted herein.

Claims 1-4, 9 and 12-15 were rejected under 35 UCS 102 as being anticipated by Herman et al, US Patent 6,144,679.

First, the undersigned notes that his file contains only 13 claims, and that the file of the client, AT&T, also contains only 13 claims. The undersigned called the Examiner in an effort to resolve the discrepancy, but the Examiner has not called. It is assumed that the Examiner erred and that, indeed, there are only 13 claims in the filed case. The new claims added are, therefore, numbered beginning at numeral 14.

Second, as for the rejection substantively, applicants respectfully traverse.

The Examiner points to FIG. 1 of the reference and assets that it describes

> a first terminal and a second terminal, the first terminal including an optical transmitter, an optical receiver, a telescope, an optical to electrical converter, an amplifier where the amplifier coupled between the telescope and the optical to electrical converter and a splitter

Applicants respectfully disagree. The Herman et al FIG. 1 describes an arrangement for generating a signal in the terahertz range. It does so by generating two optical signals at wavelengths $\lambda 1$ and $\lambda 2$ (elements 10, 15, 20, 25 and 30), combining those signals in elements 35 and 40, and focusing them onto non-linear crystal 50 with the aid of lenses that are arranged to form a telescope. Filter 55 is then interposed to separate the $\lambda 1$ and $\lambda 2$ signals from the difference signal $\lambda 3=\lambda 1-\lambda 2$, where $\lambda 3$ is the desired terahertz signal, thereby achieving the desired functionality of the arrangement.

At best, FIG. 1 of the reference is an optical transmitter, though it transmits nothing other than the carrier signal $\lambda 3$. It certainly does not describe an optical receiver (which claim 1, prior to its current amendment, specifies). Since it does not describe a receiver, it follows that it also does not describe the elements of the receiver, which

includes the telescope, an optical to electrical converter, and an optical amplifier in between.

Even if the Examiner were to assert (erroneously) that elements 10 through 40 are part of a transmitter, and that elements 43 through 55 are the receiver, it would still be true that such a "receiver" would not have an optical-to-electrical converter, nor an optical amplifier in between the telescope and the optical-to-electrical converter.

The same argument holds for *amended* claim 1.

Further, if the Examiner were to argue that elements 42 and 44 form the "telescope" of amended claim 1, that elements 35 and 40 form the "optical splitter" of amended claim 1, and that elements 10 through 30 form the transmitter that is coupled to a second port of the optical splitter, it would still be that (a) the "optical splitter" does not have a third port, (b) there is no optical receiver coupled to the third port of the optical splitter, and (c) the free-space end of the telescope is not "adapted to carry free-space, wavelength duplexed, communication."

Therefore, applicants believe that amended claim 1 is not anticipated by the Herman et al reference.

Amended claim 2 specifies a filter in the receiver, but as indicated above, it is not possible for the Herman et al reference to describer such a filter because it does not describe an optical receiver in the first place. Moreover, claim 2 specifies a <u>particular</u> placing of this filter (following the telescope and optical splitter and preceding the optical-to-electrical converter). The only filter that is described in the Herman et al arrangement (which is not a receiver) is at the end, and not between the elements that claim 2 specifies. Hence, claim 2 is not anticipated by the Herman et al reference.

As for amended claim 3, it specifies a system that includes at least two terminals that are constructed as defined in claim 1 and arranged spatially so that "the free-space ends of said two terminals exchange optical signals via free space." The Herman et al reference does not have a transmitter and a receiver, does not show two terminals, does not describe an arrangement for communicating information between two terminals, and does not describe an arrangement where such communicating is between the free-space ends of the telescopes of the two terminals. In short, that is no limitation of claim 3 that

is described by Herman et al. It is respectfully submitted, therefore, that claim 3 is not anticipated by the Herman et al reference.

As for claim 4, the Examiner can point to elements 15 and 20 as the "plural laser sources" of the claim. However, there is no element that corresponds to the claim 4 "element that combines" because the element that combines the optical signals in the Herman et al FIG. 1 – elements 35 and 40 – does not apply the results of the combining to an optical splitter (prior to its application to the telescope), as claim 4 specifies.

In connection with claim 12, in the absence of remarks by the Examiner that specify the Examiner's assertions of correspondences, applicants are left at a loss, and therefore ***assume*** that the Examiner asserts the following:

- The two signals out of element 10 correspond to the "electrical signals"
- Elements 15 and 20 generate the "plural optical signals at distinct wavelengths"
- Elements 35 and 40 do the "combining the plural optical signals
- Elements 42 and 44 form the telescope through which the "projecting" takes place.

Applicants' retort is that there is no optical amplifier in which the step of "optically amplifying the combined optical signal" takes place, as claim 12 specifies, and that consequently, there is no projecting of "the optically amplified signal." Further, the "projecting" defined in claim 12 is into "free space toward another terminal." That is not the case in the Herman et al FIG. 1, where the coupling appears to be within the same apparatus. More importantly, even if it were "projecting" and even if it were in "free space," such projecting would NOT be "toward another terminal," as the claim specifies. Therefore, it is respectfully submitted that claim 12 is not anticipated by Herman et al.

As for claim 13, Herman et al do not describe any of the method steps defined in the claim. They do not describe "receiving the free space optical signal through another telescope" at least because they do not describe "another telescope." The Examiner has offered no remarks to suggest where the Examiner believes that the reference shows another telescope, or teaches the step of "receiving the free space optical signal through another telescope." The same applied to all of the other claims.

If the Examiner chooses to maintain this rejection, applicants respectfully request that the Examiner specify elements in the drawings, or cite specific passages in the text, that support the Examiner's position.

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Claims 1-15 were rejected under 35 USC 103 as being unpatentable over Alexander et al US Patent 6,23,077 in view of Herman et al. Applicants respectfully traverse.

The Examiner asserts that Alexander et al disclose all of the subject matter claimed by applicants, save for the telescope. Applicants respectfully disagree.

Alexander et al describe a system where a plurality of optical transmitters (22, and 24) supply optical signals to remodulators 30. The outputs of the remodulators are combined in combiner 50 and then are sent over fiber 60 to an optical amplifier. The output of optical amplifier 70 is send (also over fiber 60) to an optical splitter, from whence optical signals are forwarded to remodulating selectors, and thence to receivers. Stated differently, a plurality of transmitters send signals to a plurality of receivers, through equipment that comprises elements 30, 50, 60, 70, 60, 90, and 100, effectively in series.

The Examiner has focused on FIG. 2 of Alexander et al, but had not explained his rationale for this focus. The Examiner has also stated that it would have been obvious to use a telescope in order to "provide a free space wavelength duplexed communication link."

Applicants respectfully disagree. There is no indication anywhere in the Alexander et al reference to suggest that a free-space link should be included, and the Examiner has not proposed any such point.

To give weight to the Examiner's reference to FIG. 2, it is assumed that the Examiner proposes that a skilled artisan would place a telescope somehow in association with the FIG. 2 optical remodulator 30.

It is not easy to determine whether the optical remodulator is primarily a transmitter, because it outputs a signal to combiner 50, or primarily a receiver, because it receives an optical signal from an optical transmitter (22 or 24). Applicants do not know which the Examiner has in mind or, indeed, whether the Examiner believes that the optical remodulator is both a receiver (at the interfact to the optical transmitter) AND a transmitter (at the interface to combiner 50). In any event, applicants respectfully submit that

a. There is no motivation for creating a free-space interface and, certainly, there is nothing in the Alexander et al reference that suggests it, and
b. Regardless of where a telescope is added, the resulting structure is still not the same as the one defined in applicants' claims.

There is no indication anywhere in the Alexander et al reference to suggest that the optical transmitters are far apart from the optical remodulators. If they are not, then there is no need for free space communication. More significantly, even if they are far apart – such as in a different rack of an equipment bay in an office, or in a different cabinet, the chances are extremely high that free space communication would not be desired. Since the normal communication in the vast majority of situations is direct coupled, or coupled through fiber (such as fiber 60 is FIG. 1 of Alexander et al) it is not reasonable to assume that the connection between optical transmitter 22, for example, and optical remodulator 33 would be a free space connection. To the contrary, since fiber 60 is shown to be used in the FIG. 1 arrangement for what presumably is a non-direct coupling between elements 60, 70 and 90, and no fiber is shown for the coupling between element 22 and 30, the more reasonable assumption is that the coupling between element 22 and element 30 is physically very close.

Nevertheless, even if it is assumed that a telescope is placed at the input of remodulator 30, it still does not provide the limitations of amended claim 1. Specifically, amended claim 1 specifies an optical splitter that is coupled to the equipment end of the telescope. Remodulator 30 shows no optical splitter anywhere, and certainly not at the input (where optical-to-electrical converter 31 is found). There is also no optical transmitter that is coupled to the optical splitter, as specified in amended claim 1, and there is no optical receiver as specified in amended claim 1. Stated simply, the Alexander et al structure with a telescope at the input (to element 31) is completely different from the structure defined in amended claim 1.

If it is assumed that a telescope is placed at the output of optical remodulator 30 (between remodulator 30 and combiner 50), the same conclusions are reached. There is no suggestion to employ free space, there is no motivation to employ free space, and the structure that would result if one were to put a telescope at the output of the remodulator is not at all similar to the structure defined in amended claim 1. Therefore, it is

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respectfully submitted that amended claim 1 is not obvious over Alexander et al in view of Herman et al. It follows, therefore, that all of the claims that depend on claim 1 are also not obvious over Alexander et al in view of Herman et al.

Independent claim 9 is believed to be not obvious over Alexander et al in view of Herman et al for essentially the reasons expressed above. There is no description in the combination of Alexander et al and Herman et al of a second terminal, or of a plurality of electrical signals that are electrically multiplexed, then converted to an optical signal, optically amplified, and projected through a telescope into free space to ward the second terminal.

The method claims are also believed not obvious over Alexander et al in view of Herman et al for the reasons expressed above.

In light of the above amendments and remarks, applicants respectfully submit that all of the objections and rejections have been overcome, and that all of the outstanding claims, including the newly added claims, are patentable over the cited art. Therefore, reconsideration and allowance are respectfully solicited.

Respectfully,
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